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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,968	07/15/2003	Mark A. Smith	200210076-1	9697

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EXAMINER

ZARNEKE, DAVID A

ART UNIT	PAPER NUMBER
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2891

DATE MAILED: 07/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/620,968

Applicant(s)

SMITH ET AL

Examiner

David A. Zarneke

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/16/05.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 48-52 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-13 and 48-52 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/15/03.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of species 3 (figure 3), and subspecies IV (figure 10), which correspond to claims 1-13, and 48-52 in the reply filed on 6/16/05 is acknowledged. The traversal is on the ground(s) that the search for the non-elected claims requires the same search as the elected claims. This is not found persuasive because a serious burden is placed upon the examiner to search these other species, regardless of any possible overlap in the search.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, and 7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tilmans, et al., US Patent 6,297,072.

Tilmans (figure 4 & 12-15) teaches a MEMS package, comprising: a substrate [2] with a MEMS structure (structures within cavity in Figures 12-15) fabricated on a surface of the substrate; a cover plate [1] bonded to the surface of the substrate by a

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bond ring [3]; an inner cavity defined by the substrate, the cover plate and the bond ring; and a fill port [4] defined by the substrate, the cover plate and a breach in the bond ring.

Regarding claim 2, Tilmans teaches a fluid sealed within the inner cavity (5, 36+). Note that the definition of fluid includes a gas and a liquid, see attached excerpt from Webster's Ninth New Collegiate Dictionary, page 475.

With respect to claim 3, Tilmans teaches a seal disposed in the fill port (5, 42+).

As to claim 4, Tilmans teaches the bond ring comprises at least one of a glass frit, adhesive, eutectic solder, solder mask material, anodic bond, covalent bond, laser weld or Sol-gel material (4, 41+).

In re claim 5, Tilmans teaches the seal comprises at least one of an adhesive, organic adhesive, epoxy, solder or glass-based sealant (5, 42+).

Regarding claim 7, Tilmans teaches bond pads (output pads) for making electrical connections to the MEMS package arranged in an exposed portion of the substrate (figure 16).

Claims 8-11, 13 and 7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tilmans, et al., US Patent 6,297,072.

Tilmans (figure 4 & 12-15) teaches a MEMS package adapted for use in a range of operating temperatures comprising:

a substrate [2] with MEMS circuitry (figures 12-15) fabricated on a surface of the substrate;

a cover plate [1] bonded to the surface of the substrate by a bond ring [3];

a fill port [4] defined by the substrate, the cover plate and a breach in the bond ring;

an inner cavity defined by the substrate, the cover plate and the bond ring; and fluid sealed within the inner cavity, the fluid having a coefficient of thermal expansion, wherein the inner cavity has a volume which is small enough so that expansion of the fluid throughout the range of operating temperatures is accommodated by deflections of at least the cover plate, substrate and bond ring (5, 36+).

Note that the definition of fluid includes a gas and a liquid, see attached excerpt from Webster's Ninth New Collegiate Dictionary, page 475.

Regarding claim 9, Tilmans teaches a seal disposed in the fill port (5, 42+).

With respect to claim 10, Tilmans teaches the bond ring comprises at least one of a glass frit, adhesive, eutectic solder, solder mask material, anodic bond, covalent bond, laser weld or Sol-gel material (4, 41+).

As to claim 11, Tilmans teaches the seal comprises at least one of an adhesive, organic adhesive, epoxy, solder or glass-based sealant (5, 42+).

In re claim 13, Tilmans teaches bond pads (output pads) for making electrical connections to the MEMS package arranged in an exposed portion of the substrate (figure 16).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tilmans, et al., US Patent 6,297,072, as applied to claim 1 above.

While Tilmans only teaches the reflowing of solder to create the seal, it would have been obvious to one of ordinary skill in the art to use a curable adhesive as the seal or as both the bond ring and the seal because curable adhesives and solder are conventionally known equivalents that are notoriously well known to the skilled artisan to be useable in the sealing of two substrates to form a cavity therebetween. The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tilmans, et al., US Patent 6,297,072, as applied to claim 8 above.

While Tilmans only teaches the reflowing of solder to create the seal, it would have been obvious to one of ordinary skill in the art to use a curable adhesive as the seal or as both the bond ring and the seal because curable adhesives and solder are conventionally known equivalents that are notoriously well known to the skilled artisan to be useable in the sealing of two substrates to form a cavity therebetween. The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Claims 48-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tilmans, et al., US Patent 6,297,072.

Tilmans teaches a MEMS device, comprising:

a substrate [2] with a MEMS structure (figures 12-15) fabricated on a surface of the substrate;

a cover plate [1] bonded to the surface of the substrate by a bond ring [3];

an inner cavity defined by the substrate, the cover plate and the bond ring; and

a fill port [4] defined by the substrate, the cover plate and a breach in the bond ring.

While Tilmans fails to specifically teach a spatial light modulator wherein the substrate has a MEMS mirror array fabricated thereon, Tilmans does teach the formation of MEMS devices such as micromirrors, for example (1, 19+), therefore making it obvious to one of ordinary skill in the art to use the micromirrors to form a spatial light modulator. The use of conventional materials to perform their known functions in a conventional product is obvious (MPEP 2144.07).

Regarding claim 49, Tilmans teaches a fluid sealed within the inner cavity (5, 36+). Note that the definition of fluid includes a gas and a liquid, see attached excerpt from Webster's Ninth New Collegiate Dictionary, page 475.

With respect to claim 50, Tilmans teaches a seal disposed in the fill port (5, 42+).

As to claim 51, Tilmans teaches the bond ring comprises at least one of a glass frit, adhesive, eutectic solder, solder mask material, anodic bond, covalent bond, laser weld or Sol-gel material (4, 41+).

In re claim 52, Tilmans teaches the seal comprises at least one of an adhesive, organic adhesive, epoxy, solder or glass-based sealant (5, 42+).

Conclusion

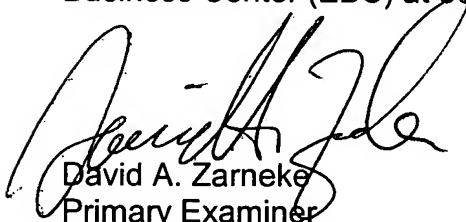
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited but not relied upon teaches the state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Zarneke whose telephone number is (571)-272-1937. The examiner can normally be reached on M-Th 7:30 AM-6 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Baumeister can be reached on (571)-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David A. Zarneke
Primary Examiner
July 19, 2005